Complete Summary

GUIDELINE TITLE

Practice guidelines for sedation and analgesia by non-anesthesiologists: an updated report by the American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists.

BIBLIOGRAPHIC SOURCE(S)

American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. Anesthesiology 2002 Apr;96(4):1004-17. [2 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Diseases or conditions that require procedures involving administration of sedation and/or analgesia by non-anesthesiologists

GUIDELINE CATEGORY

Management

CLINICAL SPECIALTY

Anesthesiology
Dentistry
Family Practice
Internal Medicine
Pediatrics

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To allow clinicians to provide their patients with the benefits of sedation/analgesia while minimizing the associated risks

TARGET POPULATION

Children and adults undergoing diagnostic or therapeutic procedures requiring sedation/analgesia

INTERVENTIONS AND PRACTICES CONSIDERED

Preprocedure Evaluation and Preparation

1. Relevant history (major organ systems, sedation/anesthesia history, medications, allergies, last oral intake, history of tobacco, alcohol, or substance use or abuse)
2. Focused physical examination (to include heart, lungs, airway)
3. Laboratory testing (guided by underlying conditions)
4. Patient counseling (risks, benefits, limitations, and alternatives)
5. Preprocedure fasting

Monitoring

1. Response to verbal commands as guide to patient's level of consciousness (when practical, or more profound stimuli for deep sedation)
2. Pulse oximetry
3. Pulmonary ventilation (observation, auscultation)
4. Exhaled carbon dioxide (considered for patients whose ventilation cannot be directly observed or for deep sedation)
5. Hemodynamics (blood pressure and heart rate)
6. Electrocardiograph (for patients with significant cardiovascular disease or for deep sedation)
7. Recording of monitored parameters

Management During Procedure

1. Use of supplemental oxygen
2. Combinations of sedative-analgesic agents
3. Titration of intravenous sedative-analgesic agents

4. Anesthetic induction agents used for sedation/analgesia (methohexital, propofol, ketamine)
5. Maintaining or establishing intravenous access
6. Availability of reversal agents (naloxone, flumazenil)
7. Recovery care (observation, discharge criteria)
8. Availability of emergency equipment (suction, defibrillator, means of positive pressure ventilation, intravenous equipment, resuscitative medications)
9. Precautions for special situations (extremes of age; severe cardiac, pulmonary, hepatic, or renal disease; pregnancy; drug or alcohol abuse, uncooperative patients, morbid obesity, potentially difficult airway, sleep apnea)

Personnel and Training

1. Designated personnel to monitor the patient throughout the procedure
2. Training in the pharmacology of sedative and analgesic agents and available antagonists
3. Training in basic life support skills
4. Availability of personnel trained in advanced life support skills (within 5 minutes, or present for deep sedation)

MAJOR OUTCOMES CONSIDERED

- Patient satisfaction
- Clinical efficacy (satisfactory sedation and analgesia)
- Adverse events

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Scientific evidence was derived from aggregated research literature and from surveys, open presentations, and other consensus-oriented activities. For purposes of literature aggregation, potentially relevant clinical studies were identified via electronic and manual searches of the literature. The electronic search covered a 36-year period from 1966 through 2001. The manual search covered a 44-year period from 1958 through 2001. More than 3,000 citations were initially identified, yielding a total of 1,876 non-overlapping articles that addressed topics related to the 15 evidence linkages. After review of the articles, 1,519 studies did not provide direct evidence and were subsequently eliminated. A total of 357 articles contained direct linkage-related evidence.

NUMBER OF SOURCE DOCUMENTS

A total of 357 articles contained direct linkage-related evidence.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The following terms describe the strength of scientific data obtained from the scientific literature:

Supportive: There is sufficient quantitative information from adequately designed studies to describe a statistically significant relationship ($P<0.01$) between a clinical intervention and a clinical outcome, using meta-analysis.

Suggestive: There is sufficient information from case reports and descriptive studies to provide a directional assessment of the relationship between a clinical intervention and a clinical outcome. This type of qualitative information does not permit a statistical assessment of significance.

Equivocal: Qualitative data have not provided a clear direction for clinical outcomes related to a clinical intervention and (1) there is insufficient quantitative information or (2) aggregated comparative studies have found no quantitatively significant differences among groups or conditions.

The following terms describe the lack of available scientific evidence in the literature:

Inconclusive: Published studies are available, but they cannot be used to assess the relationship between a clinical intervention and a clinical outcome because the studies either do not meet predefined criteria for content as defined in the "Focus of the Guidelines" or do not provide a clear causal interpretation of findings due to research design or analytic concerns.

Insufficient: There are too few published studies to investigate a relation between a clinical intervention and a clinical outcome.

Silent: No studies that address a relationship of interest were found in the available published literature.

The following terms describe survey responses from the consultants for any specified issue. Responses were solicited on a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree), with a score of 3 being neutral.

Strongly Agree: median score of 5

Agree: median score of 4

Equivocal: median score of 3

Disagree: median score of 2

Strongly Disagree: median score of 1

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

A directional result for each study was initially determined by a literature count, classifying each outcome as either supporting an evidence linkage, refuting a linkage, or neutral. (Note: These linkages represent directional statements about relationships between sedation/analgesia interventions by non-anesthesiologists and clinical outcomes [i.e., satisfactory sedation/analgesia or adverse outcomes].)The results were then summarized to obtain a directional assessment of support for each linkage. Literature pertaining to three evidence linkages contained enough studies with well-defined experimental designs and statistical information to conduct formal metaanalyses. These three linkages were: linkage 8 [supplemental oxygen], linkage 9 [benzodiazepines combined with opioids vs. benzodiazepines alone], and linkage 13 [naloxone for antagonism of opioids, flumazenil for antagonism of benzodiazepines, and flumazenil for antagonism of benzodiazepine-opioid combinations].

Combined probability tests were applied to continuous data, and an odds-ratio procedure was applied to dichotomous study results. Two combined probability tests were employed as follows: (1) the Fisher combined test, producing chi-square values based on logarithmic transformations of the reported P values from the independent studies; and (2) the Stouffer combined test, providing weighted representation of the studies by weighting each of the standard normal deviates by the size of the sample. An odds-ratio procedure based on the Mantel-Haenszel method for combining study results using 2 X 2 tables was used with outcome frequency information. An acceptable significance level was set at $P<0.01$ (one-tailed), and effect size estimates were calculated. Tests for heterogeneity of the independent studies were conducted to assure consistency among the study results. Der Simonian-Laird random-effects odds ratios were calculated when significant heterogeneity was found. To assess potential publishing bias, a "failsafe N" value was calculated for each combined probability test. No search for unpublished studies was conducted, and no reliability tests for locating research results were performed.

Metaanalytic results are reported in table 2 of the original guideline document. The following outcomes were found to be significant for combined probability tests: (1) oxygen saturation, linkage 8 (supplemental oxygen); (2) sedation recovery, linkage 13 (naloxone for antagonism of opioids and flumazenil for antagonism of benzodiazepine--opioid combinations); (3) psychomotor recovery, linkage 13 (flumazenil for antagonism of benzodiazepines); and (4) respiratory-ventilatory recovery, linkage 13 (naloxone for antagonism of opioids, flumazenil for antagonism of benzodiazepines, and flumazenil for antagonism of benzodiazepine-- opioid combinations). To be considered acceptable findings of significance, both the Fisher and weighted Stouffer combined test results must agree. Weighted effect size values for these linkages ranged from $r = 0.19$ to 0.80, representing moderate to high effect size estimates.

Mantel-Haenszel odds ratios were significant for the following outcomes: (1) hypoxemia, linkage 8 (supplemental oxygen) and linkage 9 (benzodiazepine-opioid combinations vs. benzodiazepines alone); (2) sedation recovery, linkage 13 (flumazenil for antagonism of benzodiazepines); and (3) recall of procedure, linkage 9 (benzodiazepine-opioid combinations). To be considered acceptable findings of significance, Mantel--Haenszel odds ratios must agree with combined test results when both types of data are assessed.

Interobserver agreement among Task Force members and two methodologists was established by interrater reliability testing. Agreement levels using a Kappa statistic for two-rater agreement pairs were as follows: (1) type of study design, Kappa = 0.25-0.64; (2) type of analysis, Kappa = 0.36-0.83; (3) evidence linkage assignment, Kappa = 0.78-0.89; and (4) literature inclusion for database, Kappa = 0.71-1.00. Three-rater chance corrected agreement values were: (1) study design, Sav = 0.45, Var (Sav) = 0.012; (2) type of analysis, Sav = 0.51, Var (Sav) = 0.015; (3) linkage assignment, Sav = 0.81 Var (Sav) = 0.006; (4) literature database inclusion, Sav = 0.84 Var (Sav) = 0.046. These values represent moderate to high levels of agreement.

The findings of the literature analyses were supplemented by the opinions of Task Force members as well as by surveys of the opinions of a panel of consultants drawn from the following specialties where sedation and analgesia are commonly administered: Anesthesiology, 8; Cardiology, 2; Dental Anesthesiology, 3; Dermatology, 2; Emergency Medicine, 5; Gastroenterology, 9; Intensive Care, 1; Oral and Maxillofacial Surgery, 5; Pediatrics, 1; Pediatric Dentistry, 3; Pharmacology, 1; Pulmonary Medicine, 3; Radiology, 3; Surgery, 3; and Urology, 2. The rate of return for this Consultant survey was 78% (n = 51/65). Median agreement scores from the Consultants regarding each linkage are reported in table 3 of the original guideline document.

For moderate sedation, Consultants were supportive of all of the linkages with the following exceptions: linkage 3 (electrocardiogram monitoring and capnography), linkage 9 (sedatives combined with analgesics for reducing adverse outcomes), linkage 11 (avoiding general anesthesia sedatives for improving satisfactory sedation), linkage 13b (routine administration of naloxone), linkage 13c (routine administration of flumazenil), and linkage 15b (anesthesiologist consultation for patients with medical conditions to provide satisfactory moderate sedation). In addition, Consultants were equivocal regarding whether postgraduate training in anesthesiology improves moderate sedation or reduces adverse outcomes.

For deep sedation, Consultants were supportive of all of the linkages with the following exceptions: linkage 9 (sedatives combined with analgesics for reducing adverse outcomes), linkage 11 (avoiding general anesthesia sedatives), linkage 13b (routine administration of naloxone), and linkage 13c (routine administration of flumazenil).

The Consultants were asked to indicate which, if any, of the evidence linkages would change their clinical practices if the updated Guidelines were instituted. The rate of return was 57% (n=37/65). The percent of responding Consultants expecting no change associated with each linkage were as follows: preprocedure patient evaluation, 94%; preprocedure patient preparation, 91%; patient monitoring, 80%; contemporaneous recording of monitored parameters, 91%;

availability of individual dedicated solely to patient monitoring and safety, 91%; education and training of sedation-analgesia providers in pharmacology, 89%; presence of an individual(s) capable of establishing a patent airway, 91%; availability of appropriately sized emergency and airway equipment, 94%; use of supplemental oxygen during procedures, 100%; use of sedative agents combined with analgesic agents, 91%; titration of sedatives-analgesics, 97%; intravenous sedation-analgesia with agents designed for general anesthesia, 77%; administration of sedative-analgesic agents by the intravenous route, 94%; maintaining or establishing intravenous access, 97%; availability-use of flumazenil, 94%; availability-use of naloxone, 94%; observation and monitoring during recovery, 89%; special care for patients with underlying medical problems, 91%; and special care for uncooperative patients, 94%. Seventy-four percent of the respondents indicated that the Guidelines would have no effect on the amount of time spent on a typical case. Nine respondents (26%) indicated that there would be an increase in the amount of time they would spend on a typical case with the implementation of these Guidelines. The amount of increased time anticipated by these respondents ranged from 1 to 60 min.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The American Society of Anesthesiologists (ASA) appointed a Task Force of 10 members to review the published evidence, obtain the opinion of a panel of consultants, including non-anesthesiologist physicians and dentists who routinely administer sedation/analgesia, as well as of anesthesiologists with a special interest in sedation/analgesia (see Appendix I of the original guideline document) and build consensus within the community of practitioners likely to be affected by the Guidelines. The Task Force included anesthesiologists in both private and academic practices from various geographic areas of the United States, a gastroenterologist, and methodologists from the ASA Committee on Practice Parameters.

This Practice Guideline is an update and revision of the ASA Guidelines for Sedation and Analgesia by Non-Anesthesiologists. The Task Force revised and updated the Guidelines by means of a five-step process. First, original published research studies relevant to the revision and update were reviewed and analyzed; only articles relevant to the administration of sedation by non-anesthesiologists were evaluated. Second, the panel of expert consultants was asked to (1) participate in a survey related to the effectiveness and safety of various methods and interventions that might be used during sedation/analgesia, and (2) review and comment on the initial draft report of the Task Force. Third, the Task Force held open forums at two major national meetings to solicit input on its draft recommendations. National organizations representing most of the specialties whose members typically administer sedation-analgesia were invited to send representatives. Fourth, the consultants were surveyed to assess their opinions on the feasibility and financial implications of implementing the revised and updated Guidelines. Finally, all of the available information was used by the Task Force to finalize the Guidelines.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The panel of expert consultants was asked to review and comment on the initial draft report of the Task Force.

The Task Force held open forums at two major national meetings to solicit input on its draft recommendations. National organizations representing most of the specialties whose members typically administer sedation/analgesia were invited to send representatives.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Patient Evaluation

Clinicians administering sedation/ analgesia should be familiar with sedation-oriented aspects of the patient's medical history and how these might alter the patient's response to sedation/analgesia. These include: (1) abnormalities of the major organ systems; (2) previous adverse experience with sedation/analgesia as well as regional and general anesthesia; (3) drug allergies, current medications, and potential drug interactions; (4) time and nature of last oral intake; and (5) history of tobacco, alcohol, or substance use or abuse. Patients presenting for sedation/analgesia should undergo a focused physical examination, including vital signs, auscultation of the heart and lungs, and evaluation of the airway (See Example I below). Preprocedure laboratory testing should be guided by the patient's underlying medical condition and the likelihood that the results will affect the management of sedation/analgesia. These evaluations should be confirmed immediately before sedation is initiated.

Example I. Airway Assessment Procedures for Sedation and Analgesia

Positive pressure ventilation, with or without tracheal intubation, may be necessary if respiratory compromise develops during sedation/analgesia. This may be more difficult in patients with atypical airway anatomy. In addition, some airway abnormalities may increase the likelihood of airway obstruction during

spontaneous ventilation. Some factors that may be associated with difficulty in airway management are:

- History
  - Previous problems with anesthesia or sedation
  - Stridor, snoring, or sleep apnea
  - Advanced rheumatoid arthritis
  - Chromosomal abnormality (e.g., trisomy 21)
- Physical Examination
  - Habitus
    - Significant obesity (especially involving the neck and facial structures)
  - Head and Neck
    - Short neck; limited neck extension; decreased hyoid--mental distance (<3 cm in an adult); neck mass; cervical spine disease or trauma; tracheal deviation; dysmorphic facial features (e.g., Pierre-Robin syndrome)
  - Mouth
    - Small opening (<3 cm in an adult); edentulous; protruding incisors; loose or capped teeth; dental appliances; high, arched palate; macroglossia; tonsillar hypertrophy; nonvisible uvula
  - Jaw
    - Micrognathia; retrognathia; trismus; significant malocclusion

Preprocedure Preparation

Patients (or their legal guardians in the case of minors or legally incompetent adults) should be informed of and agree to the administration of sedation/analgesia, including its benefits, risks, and limitations associated with this therapy, as well as possible alternatives. Patients undergoing sedation/analgesia for elective procedures should not drink fluids or eat solid foods for a sufficient period of time to allow for gastric emptying before their procedure, as recommended by the American Society of Anesthesiologists (ASA) "Practice Guidelines for Preoperative Fasting" (1999) (See Example II below). In urgent, emergent, or other situations in which gastric emptying is impaired, the potential for pulmonary aspiration of gastric contents must be considered in determining (1) the target level of sedation, (2) whether the procedure should be delayed, or (3) whether the trachea should be protected by intubation.

Example II. Summary of American Society of Anesthesiologists Preprocedure Fasting Guidelines*

Ingested Material	Minimum Fasting Period**
Clear liquids***	2 h
Breast milk	4 h
Infant formula	6 h
Nonhuman milk[#]	6 h
Light meal[##]	6 h

* These recommendations apply to healthy patients who are undergoing elective procedures. They are not intended for women in labor. Following the Guidelines does not guarantee a complete gastric emptying has occurred.

** The fasting periods apply to all ages.

*** Examples of clear liquids include water, fruit juices without pulp, carbonated beverages, clear tea, and black coffee.

Since nonhuman milk is similar to solids in gastric emptying time, the amount ingested must be considered when determining an appropriate fasting period.

A light meal typically consists of toast and clear liquids. Meals that include fried or fatty foods or meat may prolong gastric emptying time. Both the amount and type of foods ingested must be considered when determining an appropriate fasting period.

Monitoring

Monitoring of patient response to verbal commands should be routine during moderate sedation, except in patients who are unable to respond appropriately (e.g., young children, mentally impaired or uncooperative patients), or during procedures where movement could be detrimental. During deep sedation, patient responsiveness to a more profound stimulus should be sought, unless contraindicated, to ensure that the patient has not drifted into a state of general anesthesia. During procedures where a verbal response is not possible (e.g., oral surgery, upper endoscopy), the ability to give a "thumbs up" or other indication of consciousness in response to verbal or tactile (light tap) stimulation suggests that the patient will be able to control his airway and take deep breaths if necessary, corresponding to a state of moderate sedation. Note that a response limited to reflex withdrawal from a painful stimulus is not considered a purposeful response and thus represents a state of general anesthesia.

All patients undergoing sedation/analgesia should be monitored by pulse oximetry with appropriate alarms. If available, the variable pitch "beep," which gives a continuous audible indication of the oxygen saturation reading, may be helpful. In addition, ventilatory function should be continually monitored by observation or auscultation. Monitoring of exhaled carbon dioxide should be considered for all patients receiving deep sedation and for patients whose ventilation cannot be directly observed during moderate sedation. When possible, blood pressure should be determined before sedation/analgesia is initiated. Once sedation/analgesia is established, blood pressure should be measured at 5-minute intervals during the procedure, unless such monitoring interferes with the procedure (e.g., pediatric magnetic resonance imaging, where stimulation from the blood pressure cuff could arouse an appropriately sedated patient). Electrocardiographic monitoring should be used in all patients undergoing deep sedation. It should also be used during moderate sedation in patients with significant cardiovascular disease or those who are undergoing procedures where dysrhythmias are anticipated.

Recording of Monitored Parameters

For both moderate and deep sedation, patients' level of consciousness, ventilatory and oxygenation status, and hemodynamic variables should be assessed and recorded at a frequency that depends on the type and amount of medication administered, the length of the procedure, and the general condition of the patient. At a minimum, this should be: (1) before the beginning of the procedure; (2) after administration of sedative-analgesic agents; (3) at regular intervals during the procedure, (4) during initial recovery; and (5) just before discharge. If recording is performed automatically, device alarms should be set to alert the care team to critical changes in patient status.

Availability of an Individual Responsible for Patient Monitoring

A designated individual, other than the practitioner performing the procedure, should be present to monitor the patient throughout procedures performed with sedation/analgesia. During deep sedation, this individual should have no other responsibilities. However, during moderate sedation, this individual may assist with minor, interruptible tasks once the patient's level of sedation/analgesia and vital signs have stabilized, provided that adequate monitoring for the patient's level of sedation is maintained.

Training of Personnel

Individuals responsible for patients receiving sedation/analgesia should understand the pharmacology of the agents that are administered, as well as the role of pharmacologic antagonists for opioids and benzodiazepines. Individuals monitoring patients receiving sedation/analgesia should be able to recognize the associated complications. At least one individual capable of establishing a patent airway and positive pressure ventilation, as well as a means for summoning additional assistance, should be present whenever sedation--analgesia is administered. It is recommended that an individual with advanced life support skills be immediately available (within 5 minutes) for moderate sedation and within the procedure room for deep sedation.

Availability of Emergency Equipment

Pharmacologic antagonists as well as appropriately sized equipment for establishing a patent airway and providing positive pressure ventilation with supplemental oxygen should be present whenever sedation/analgesia is administered. Suction, advanced airway equipment, and resuscitation medications should be immediately available and in good working order (see Example III in original guideline document). A functional defibrillator should be immediately available whenever deep sedation is administered and when moderate sedation is administered to patients with mild or severe cardiovascular disease.

Use of Supplemental Oxygen

Equipment to administer supplemental oxygen should be present when sedation/analgesia is administered. Supplemental oxygen should be considered for moderate sedation and should be administered during deep sedation unless specifically contraindicated for a particular patient or procedure. If hypoxemia is anticipated or develops during sedation/ analgesia, supplemental oxygen should be administered.

Combinations of Sedative/Analgesic Agents

Combinations of sedative and analgesic agents may be administered as appropriate for the procedure being performed and the condition of the patient. Ideally, each component should be administered individually to achieve the desired effect (e.g., additional analgesic medication to relieve pain; additional sedative medication to decrease awareness or anxiety). The propensity for combinations of sedative and analgesic agents to cause respiratory depression and airway obstruction emphasizes the need to appropriately reduce the dose of each component as well as the need to continually monitor respiratory function.

Titration of Intravenous Sedative/Analgesic Medications

Intravenous sedative/analgesic drugs should be given in small, incremental doses that are titrated to the desired end points of analgesia and sedation. Sufficient time must elapse between doses to allow the effect of each dose to be assessed before subsequent drug administration. When drugs are administered by nonintravenous routes (e.g., oral, rectal, intramuscular, transmucosal), allowance should be made for the time required for drug absorption before supplementation is considered. Because absorption may be unpredictable, administration of repeat doses of oral medications to supplement sedation/ analgesia is not recommended.

Anesthetic Induction Agents Used for Sedation/Analgesia (Propofol, Methohexital, Ketamine)

Even if moderate sedation is intended, patients receiving propofol or methohexital by any route should receive care consistent with that required for deep sedation. Accordingly, practitioners administering these drugs should be qualified to rescue patients from any level of sedation, including general anesthesia. Patients receiving ketamine should be cared for in a manner consistent with the level of sedation that is achieved.

Intravenous Access

In patients receiving intravenous medications for sedation/analgesia, vascular access should be maintained throughout the procedure and until the patient is no longer at risk for cardiorespiratory depression. In patients who have received sedation/analgesia by nonintravenous routes, or whose intravenous line has become dislodged or blocked, practitioners should determine the advisability of establishing or reestablishing intravenous access on a case-by-case basis. In all instances, an individual with the skills to establish intravenous access should be immediately available.

Reversal Agents

Specific antagonists should be available whenever opioid analgesics or benzodiazepines are administered for sedation/analgesia. Naloxone or flumazenil may be administered to improve spontaneous ventilatory efforts in patients who have received opioids or benzodiazepines, respectively. This may be especially helpful in cases where airway control and positive pressure ventilation are difficult. Before or concomitantly with pharmacologic reversal, patients who

become hypoxemic or apneic during sedation/analgesia should: (1) be encouraged or stimulated to breathe deeply; (2) receive supplemental oxygen; and (3) receive positive pressure ventilation if spontaneous ventilation is inadequate. After pharmacologic reversal, patients should be observed long enough to ensure that sedation and cardiorespiratory depression does not recur once the effect of the antagonist dissipates. The use of sedation regimens that include routine reversal of sedative or analgesic agents is discouraged.

Recovery Care

Following sedation/analgesia, patients should be observed in an appropriately staffed and equipped area until they are near their baseline level of consciousness and are no longer at increased risk for cardiorespiratory depression. Oxygenation should be monitored periodically until patients are no longer at risk for hypoxemia. Ventilation and circulation should be monitored at regular intervals until patients are suitable for discharge. Discharge criteria should be designed to minimize the risk of central nervous system or cardiorespiratory depression after discharge from observation by trained personnel (See Example IV in original guideline document).

Special Situations

Whenever possible, appropriate medical specialists should be consulted before administration of sedation to patients with significant underlying conditions. The choice of specialists depends on the nature of the underlying condition and the urgency of the situation. For severely compromised or medically unstable patients (e.g., anticipated difficult airway, severe obstructive pulmonary disease, coronary artery disease, or congestive heart failure), or if it is likely that sedation to the point of unresponsiveness will be necessary to obtain adequate conditions, practitioners who are not trained in the administration of general anesthesia should consult an anesthesiologist.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Scientific evidence was derived from multiple sources, including aggregated research literature (with metaanalyses when appropriate), surveys, open presentations, and other consensus-oriented activities.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Appropriate use of sedation/analgesia
- Decreased adverse effects
- Improved patient outcomes and satisfaction

POTENTIAL HARMS

- Excessive sedation/analgesia may result in cardiac or respiratory depression that must be rapidly recognized and appropriately managed to avoid the risk of hypoxic brain damage, cardiac arrest, or death
- Inadequate sedation/analgesia may result in undue patient discomfort or patient injury because of lack of cooperation or adverse physiologic or psychological response to stress.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- Practice guidelines are systematically developed recommendations that assist the practitioner and patient in making decisions about health care. These recommendations may be adopted, modified, or rejected according to clinical needs and constraints. Practice guidelines are not intended as standards or absolute requirements. The use of practice guidelines cannot guarantee any specific outcome. Practice guidelines are subject to revision as warranted by the evolution of medical knowledge, technology, and practice. The guidelines provide basic recommendations that are supported by analysis of the current literature and by a synthesis of expert opinion, open forum commentary, and clinical feasibility data.
- These Guidelines are intended to be general in their application and broad in scope. The appropriate choice of agents and techniques for sedation/analgesia is dependent on the experience and preference of the individual practitioner, requirements or constraints imposed by the patient or procedure, and the likelihood of producing a deeper level of sedation than anticipated. Because it is not always possible to predict how a specific patient will respond to sedative and analgesic medications, practitioners intending to produce a given level of sedation should be able to rescue patients whose level of sedation becomes deeper than initially intended. For moderate sedation, this implies the ability to manage a compromised airway or hypoventilation in a patient who responds purposefully after repeated or painful stimulation, whereas for deep sedation, this implies the ability to manage respiratory or cardiovascular instability in a patient who does not respond purposefully to painful or repeated stimulation. Levels of sedation referred to in the recommendations relate to the level of sedation intended by the practitioner. Examples are provided to illustrate airway assessment, preoperative fasting, emergency equipment, and recovery procedures; however, clinicians and their institutions have ultimate responsibility for selecting patients, procedures, medications, and equipment

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. Anesthesiology 2002 Apr;96(4):1004-17. [2 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2002 Apr

GUIDELINE DEVELOPER(S)

American Society of Anesthesiologists - Medical Specialty Society

SOURCE(S) OF FUNDING

American Society of Anesthesiologists

GUIDELINE COMMITTEE

Task Force on Sedation and Analgesia by Non-Anesthesiologists

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Society for Anesthesiologists Web site.

Print copies: Available from the American Society for Anesthesiologists, 520 North Northwest Highway, Park Ridge, IL 60068-2573.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

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